IN THE CLAIMS

Please amend the claims as follows.

Claims 1-23 (Cancelled).

24. (Currently Amended) A charge pump, comprising:

a first current source capable of injecting a first charging current onto a loop filter, the first charging current controlled based on a first control signal;

a second current source capable of draining a first discharging current from the loop filter, the first discharging current controlled based on a second control signal;

a third current source capable of injecting a second charging current onto an integrator capacitor and a fourth current source capable of draining a second discharging current from the integrator capacitor, the second charging current and the second discharging current controlled based on the first and second control signals; and

a circuit capable of detecting a voltage difference between a voltage on the loop filter and a voltage on the integrator capacitor, the circuit further capable of controlling the first and third current sources to at least partially reduce the voltage difference.

25. (Previously Presented) The charge pump of Claim 24, wherein:

the first and third current sources form a first current mirror, wherein the first charging current mirrors the second charging current by a factor of M; and

the second and fourth current sources form a second current mirror, wherein the first discharging current mirrors the second discharging current by the factor of M.

26. (Previously Presented) The charge pump of Claim 24, further comprising:

a first switch capable of coupling the first current source to the loop filter, the first switch capable of being controlled by the first control signal; and

a second switch capable of coupling the second current source to the loop filter, the second switch capable of being controlled by the second control signal.

27. (Previously Presented) The charge pump of Claim 26, further comprising:

a third switch capable of coupling the third current source to the integrator capacitor;

a fourth switch capable of coupling the fourth current source to the integrator capacitor; and

an AND gate capable of receiving the first and second control signals, the third and fourth switches capable of being controlled by an output of the AND gate.

28. (Previously Presented) The charge pump of Claim 24, wherein the circuit comprises an amplifier having inputs coupled to the integrator capacitor and the loop filter.

29. (Previously Presented) The charge pump of Claim 24, further comprising a current reference capable of controlling the second and fourth current sources.

30. (Currently Amended) A circuit, comprising:

at least one of a phase locked loop and a delay locked loop, at least one of the phase locked loop and the delay locked loop comprising a charge pump;

the charge pump comprising:

a first current source capable of injecting a first charging current onto a loop filter, the first charging current controlled based on a first control signal;

a second current source capable of draining a first discharging current from the loop filter, the first discharging current controlled based on a second control signal;

a third current source capable of injecting a second charging current onto an integrator capacitor and a fourth current source capable of draining a second discharging current from the integrator capacitor, the second charging current and the second discharging current controlled based on the first and second control signals; and

a circuit capable of detecting a voltage difference between a voltage on the loop filter and a voltage on the integrator capacitor, the circuit further capable of controlling the first and third current sources to at least partially reduce the voltage difference.

31. (Previously Presented) The circuit of Claim 30, wherein:

the first and third current sources form a first current mirror, wherein the first charging current mirrors the second charging current by a factor of M; and

the second and fourth current sources form a second current mirror, wherein the first discharging current mirrors the second discharging current by the factor of M.

32. (Previously Presented) The circuit of Claim 30, wherein the charge pump further comprises:

a first switch capable of coupling the first current source to the loop filter, the first switch capable of being controlled by the first control signal; and

a second switch capable of coupling the second current source to the loop filter, the second switch capable of being controlled by the second control signal.

33. (Previously Presented) The circuit of Claim 32, wherein the charge pump further comprises:

a third switch capable of coupling the third current source to the integrator capacitor;

a fourth switch capable of coupling the fourth current source to the integrator capacitor; and

an AND gate capable of receiving the first and second control signals, the third and fourth switches capable of being controlled by an output of the AND gate.

34. (Previously Presented) The circuit of Claim 30, wherein the circuit comprises an amplifier having inputs coupled to the integrator capacitor and the loop filter.

35. (Previously Presented) The circuit of Claim 30, wherein the charge pump further comprises a current reference capable of controlling the second and fourth current sources.

36. (Previously Presented) The circuit of Claim 30, wherein the phase locked loop further comprises:

a voltage controlled oscillator capable of generating an output signal;

an input divider capable of receiving an input signal and dividing the input signal by a first value;

a feedback divider capable of dividing the output signal by a second value; and

a phase frequency detector capable of comparing the divided input signal and the divided output signal and generating the first and second control signals.

37. (Previously Presented) The circuit of Claim 36, further comprising:

an oscillator capable of providing the input signal to the input divider in the phase locked loop;

a system control section; and

a system process section.

38. (Previously Presented) A method, comprising:

coupling a first charging current from a first current source to a loop filter to at least partially charge the loop filter;

coupling a first discharging current from a second current source to the loop filter to at least partially discharge the loop filter;

coupling a second charging current from a third current source and a second discharging current from a fourth current source to an integrator capacitor;

detecting a voltage difference between a voltage on the loop filter and a voltage on the integrator capacitor; and

adjusting at least one of the first and third current sources to at least partially reduce the voltage difference.

39. (Previously Presented) The method of Claim 38, wherein:

the first and third current sources form a first current mirror, wherein the first charging current mirrors the second charging current by a factor of M; and

the second and fourth current sources form a second current mirror, wherein the first discharging current mirrors the second discharging current by the factor of M.

40. (Previously Presented) The method of Claim 38, wherein:

coupling the first charging current to the loop filter comprises closing a first switch coupled to the first current source and the loop filter; and

coupling the first discharging current to the loop filter comprises closing a second switch coupled to the second current source and the loop filter.

41. (Previously Presented) The method of Claim 40, wherein coupling the second charging current and the second discharging current to the integrator capacitor comprises:

closing a third switch coupled to the third current source and the integrator capacitor; and

closing a fourth switch coupled to the fourth current source and the integrator capacitor.

42. (Previously Presented) The method of Claim 41, wherein closing the first, second, third, and fourth switches comprises:

closing the first switch based on a first control signal;

closing the second switch based on a second control signal; and

closing the third and fourth switches based on the first and second control signals.

43. (Previously Presented) The method of Claim 42, further comprising controlling the second and fourth current sources using a current reference.